

WHAT IS CLAIMED IS:

5 1. A reconfigurable digital processor for film conversion, the reconfigurable digital processor comprising:

a plurality of reprogrammable circuit elements configured to receive digital data corresponding to film image pixels and perform one or more film conversion processing steps on the film image pixels using digital technology;

10 a supervisor control circuit configured to communicate with and instruct the plurality of reprogrammable circuit elements on sequencing of the film conversion processing steps; and

a formatter configured to receive one or more outputs from the plurality of reprogrammable circuit elements and produce one or more digital motion picture files.

15 2. The reconfigurable digital processor of Claim 1, wherein software codes are used to reconfigure one or more of the reprogrammable circuit elements to support a different film conversion processing step.

20 3. The reconfigurable digital processor of Claim 1, wherein the reprogrammable circuit elements are field programmable gate arrays.

25 4. The reconfigurable digital processor of Claim 1, wherein the reprogrammable circuit elements are digital signal processors.

5. The reconfigurable digital processor of Claim 1, wherein the number of reprogrammable circuit elements is chosen to trade-off throughput and cost.

30 6. The reconfigurable digital processor of Claim 1, wherein at least one of the digital motion picture files is processed by a digital-to-analog converter for display on a video monitor.

7. The reconfigurable digital processor of Claim 1, wherein at least one of the digital motion picture files is provided to a digital monitor for viewing.

8. The reconfigurable digital processor of Claim 2, wherein reconfiguration occurs during a film conversion session.

9. The reconfigurable digital processor of Claim 2, wherein reconfiguration is used to trade-off complexity of film conversion processing steps and throughput rates of the one or more digital motion picture files.

10. A method of processing film images using digital technology, the method comprising:

using mechanical and optical devices to provide images from a sequence of film frames to two or more photo-sensor arrays;

controlling the operations of the photo-sensor arrays to be synchronous with movement of the film frames;

digitizing analog signals produced by the two or more photo-sensor arrays;

providing the digitized analog signals to a digital processing core for one or more film processing functions; and

manipulating one or more outputs from the digital-processing core to produce a digital motion picture file conforming to a standard format.

11. The method of Claim 10, wherein the digital processing core is a combination of field programmable gate arrays and digital signal processors.

12. The method of Claim 10, wherein the digital processing core is reconfigurable with software codes to perform different film processing functions.

13. The method of Claim 12, wherein the digital processing core is reconfigured to adapt to a change in the standard format of the digital motion picture file.

14. A method of building a cost-efficient film conversion device, the method comprising:

using photosensitive detectors to produce electrical signals
5 corresponding to film pixels;

coupling analog-to-digital converters to the photosensitive detectors to
digitize the electrical signals;

scaling the number of programmable electronic circuit elements in the
film conversion device based on cost constraints; and

10 customizing the programmable electronic circuits using software codes
to perform one or more film conversion functions on the digitized electrical
signals.

15 15. The method of Claim 14, wherein one or more programmable electronic
circuit elements are reconfigurable using software codes during a film conversion
session to support different film conversion functions.

16. A device for generating electrical signals representing images recorded on film to an electronic format, said device comprising:

a platform supporting film reels;

5 a scanning module separate from said platform comprising an illuminating subassembly, a film guide subassembly, and an image subassembly;

said illumination subassembly including a lamp;

said film guide subassembly including a guide having a slit over which said film passes, said slit being illuminated by said illumination subassembly;

10 said imaging subassembly including an array of photosensitive detectors that receive light that passes through said slit and said film and outputs electrical analog signals corresponding to respective pixels in said film image;

an analog-to-digital converter configured to produce digital values to represent said analog signals;

15 a plurality of reprogrammable circuit elements configured to receive digital data corresponding to film image pixels and perform one or more film conversion processing steps on the film image pixels using digital technology;

20 a supervisor control circuit configured to communicate with and instruct the plurality of reprogrammable circuit elements on sequencing of the film conversion processing steps; and

a formatter configured to receive one or more outputs from the plurality of reprogrammable circuit elements and produce one or more digital motion picture files.